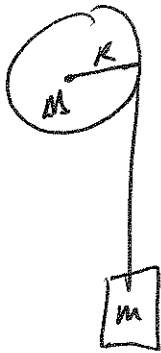


N2 in rotational form examples

unwinding disk



$$\sum \tau = I\alpha = F_T R$$

$$\alpha = a/R$$

$$\frac{Ia}{R} = F_T R = (mg - ma)R$$

$$\frac{Ia}{R} = mgR - maR$$

$$\frac{Ia}{R} + maR = mgR$$

$$a\left(\frac{I}{R} + mR\right) = mgR$$

for solid disk, $I = \frac{1}{2}MR^2$

$$a\left(\frac{MR^2}{2R} + mR\right) = mgR$$

$$a\left(\frac{MR}{2} + mR\right) = mgR$$

$$aR\left(\frac{1}{2}M + m\right) = mgR$$

$$a = \frac{mg}{\left(\frac{1}{2}M + m\right)}$$

$$\sum F = ma = mg - F_T$$

$$F_T = mg - ma$$